

Category: Construction & Mining

California's construction & mining off-road emissions inventory is an estimate of the amount and types of pollutants emitted from thousands of pieces of equipment used in construction & mining applications. These equipment types comprise of 2-stroke and 4- stroke gasoline and diesel engines.

The top 5 most popular equipment types in this category are:

<u>Equipment Type</u>	<u>Fuel Type</u>	<u>2000 Population</u>
Cement and Mortar Mixers	G4	28795
Skid Steer Loaders	D	28460
Tractors/Loaders/Backhoes	D	28214
Paving Equipment	G4	20716
Rubber Tired Loaders	D	17853

The top 5 equipment with the highest annual activity are:

<u>Equipment Type</u>	<u>Fuel Type</u>	<u>(hr/yr) Activity</u>
Off-Highway Trucks	D	1958
Rubber Tired Dozers	D	1589
Excavators	D	1396
Cranes	D	1252
Rough Terrain Forklifts	D	1123

Emissions Inventory:

As with other OFFROAD equipment types, the emissions inventory for the construction & mining category is calculated as the product of the emission rate (grams per horsepower-hour), engine population, and activity (hours per year) in annual average use hours.

[Calculating Emissions Inventory \(PDF Format\)](#)

For the current emissions inventory (tons/day):

[Air Resources Board Almanac](#)

Input Data Sources:

The input factors used by the OFFROAD Model come from various data sources:

Input Factor	Source of Data (Diesel)
Population (base year 2000)	MacKay Survey (2003); Power Systems Research (2005)
Useful Life	MacKay Survey (2003); ARB (MSCD) Diesel Equip Survey (2005)
Activity (hr/yr)	MacKay Survey (2003); Power Systems Research (1996)
Activity by Age	ARB (MSCD) Diesel Equip Survey (2005)
Average horsepower	Power Systems Research (1996)
Load factor	Power Systems Research (1996)
Allocation factor	Energy & Environmental Analysis (EEA) document (1995)
Growth factor	DRI/McGraw-Hill employment data (1994)
Survival rate	Power Systems Research (1996)

For more additional background information on the input factors used by the OFFROAD Model: [\(Document Link\)](#)

For tables of input data for construction & mining: [\(Document Link\)](#)

Adopted Regulations for Construction & Mining:

2004: (*Reflected in OFFROAD Model*) Board approved amendment to California's existing off-road diesel regulations to harmonize with USEPA Tier 4 regulation (40 CFR 1039). [\(Document Link\)](#)

2000: (*Reflected in OFFROAD Model*) Board approved the emissions inventory for off-road large CI engines ($\geq 25\text{hp}$) from the OFFROAD Model. [\(Document Link\)](#)

Future Improvements to the Construction & Mining Category:

The emissions inventory from the OFFROAD Model strives to accurately represent the 'real-world' as accurately as possible. Therefore, the methodologies and data sources are constantly re-evaluated and updated where applicable. The following items are future improvements for the construction & mining category:

- Update population and activity values as new data becomes available
- Revise growth factors using REMI employment data (2001)
- Allocate equipment from the county down to the neighborhood level (GIS)